UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,077	10/24/2003	Qing Yang	022193-105.11US	3381

20350 7590 06/07/2007

TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER	
GU, SHAWN X	

ART UNIT	PAPER NUMBER
2189	

MAIL DATE	DELIVERY MODE
06/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/693,077	YANG, QING	
	Examiner	Art Unit	
	Shawn X. Gu	2189	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25,26,30,31,37,41,42 and 44-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,26,30,31,37,41,42 and 44-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This final Office action is in response to the amendment filed 22 May 2007. Claims 25, 26, 30, 31, 37, 41, 42 and 44-46 are pending. Claims 1-24, 27-29, 32-36, 38-40 and 43 have been cancelled. All objections and rejections not repeated below are withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 25, 26, 30, 31, 37, 41, 42 and 44-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Carter et al. [6,148,377] (hereinafter "Carter").

Per claims 25, 37, 44, 45 and 46, Carters teaches an information backup system (Computer Network 10, Fig.1; for backup, see "replication" in col.10, ln.25-40, "fault-tolerant" in col.2, ln.54-55; also tape, disk, and RAID mentioned in col.3, ln.35-40 all imply a backup system) comprising:

a plurality of computer systems (Nodes 12a-c, Fig.1; Col.5, Ln.60-67), each including a disk subsystem (Fig 2, 36a, 36b and Network Disk 20, see col.7, ln.1-8) and a network interface (Fig 3, 52, and col.9, ln.57), wherein each computer system is configured to generate disk I/O requests and to direct said disk I/O requests to said network interface (see Figs 3, 4 and 7, also see col. 10, lines 58-67, col. 11, lines 1-67 and col. 14, lines 23-50; the disk I/O requests are the Requests 112 that request pages stored in persistent/disk storage);

a communication network (Network 10 in Fig.1 and Col.6, Ln.1-11), to which each of said computer systems is coupled, said network configured to communicate said disk I/O requests and data associated with said disk I/O request among said plurality of computer systems (network shown in Figs 1-4);

a distributed cache memory (combination of local RAM caches 34a-c, see Fig.2 and Col.10, Ln.25-41) comprising a plurality of memory portions, each memory portion being a portion of a memory of a computer system among said computer systems, said memory portions being organized to function as a single coherent cache memory (the local RAM caches 34a-c serve as a single coherent cache for the shared memory space and the operation system 16, Col.7, Ln.18-38, Col.8, Ln.12-27, Col.10, Ln.25-41, Col.12 Ln.29-55); and

a distributed disk storage device (combination of RAID Disks 36a-c, see Fig.2 and col.3, ln.39-41) comprising a plurality of disk storage portions, each disk storage portion being a portion of a disk storage (Col.2, Ln.49-53) of one or more computer systems among said plurality of computer systems, said disk storage portions being organized to function as a single disk storage device (shared memory space and global address, see Fig.6, Col.7, Ln.18-52, Col.8, Ln.28-47, Col.12, Ln.30-55), wherein said computer systems access said distributed disk storage device as a single logical disk (see Figs, 3, 4 and 7, also see col. 10, lines 58-67, col. 11, lines 1-67 and col. 14, lines 23-50) by generating disk I/O requests (Requests 112 that request pages stored in persistent/disk storage, see Fig. 4) and wherein said distributed cache memory is operable as a cache memory for said distributed data storage device (each local RAM cache serves as data cache for requested pages of the shared memory space which consists of the RAID disks 36a-c; see col. 12, lines 41-45).

It is clear that claims 25, 37, 45 and 46 are already substantially disclosed in claim 44 set forth.

It is also clear that for claims 45 and 46, the first set of said computer systems is taught by Carter as Nodes 12a-12c, and Carter further teaches RAM memory (RAM, see Col.2, Ln.49-53, Col.3, Ln.22-40; Col.10, Ln.8-24).

Per claim 26, Carter further teaches said functionally coherent and physically distributed cache memory is operable as data cache for said disk I/O operations with said functionally coherent and physically distributed disk storage device (each local RAM cache serves as data cache for requested pages of the shared memory space which consists of the RAID disks 36a-c; see col. 12, lines 41-45).

Per claims 30 and 41, Carter further teaches said functionally coherent and physically distributed disk storage device is configured as a functionally coherent and physically distributed RAID storage device (RAID, see Col.3, Ln.38-40).

Per claims 31 and 42, Carter further teaches said memory portions are portions of volatile random access memories of said plurality of computer systems (RAM, see Col.2, Ln.49-53, Col.3, Ln.22-40; Col.10, Ln.8-24).

Response to Arguments

4. Applicant's arguments filed on 22 May 2007 regarding claims 25, 26, 30, 31, 37, 41, 42 and 44-46 have been considered but they are not persuasive. The claims are taught by Carter as set forth above.

Regarding the Applicant's arguments and remarks for each of the independent claims, the Examiner respectfully points out that the key difference between Carter and the Applicant's

invention as discussed in the telephonic interview on 11 May 2007 has not been exposed in the amended claims. In Carter's invention, the requests generated by the operating systems of the nodes are clearly I/O requests (read/write requests), and among the I/O requests the ones that request pages stored in persistent (disk) storage are clearly disk I/O requests even though the requestors (the operating systems) do not explicitly differentiate disk I/O requests from other types of I/O requests.

Carter also teaches the requests are responded by the disk storage device as a single logical disk. Although Carter discloses a single address space, the invention makes clear distinction between volatile storage and persistent/disk storage (see Global Disk and Global RAM directories, Fig. 4 and col. 10, lines 58-67, col. 11, lines 1-67 and col. 14, lines 23-50). The Requests 112 that access the persistent/disk storage are directed by the Flow Scheduler 72 to the Global Disk Directory 84 as shown by the arrows originated from the drawing block representing the Flow Scheduler 72. Therefore it is clear that at least the Flow Scheduler 72 has knowledge that the request is a disk I/O request else it would not have directed the operation flow to the Global Disk Directory 84. The Flow Scheduler 72 is part of the Shared Memory Subsystem 40 as shown in Fig 3, which is in turn part of the Computer System (Node 12). These requests are served with either the local or remote disks, but to the Flow Scheduler 72 there is only one logical disk, or an unified logical disk storage device as recited in claim 37. The reason is that the Global Disk Directory 84 provides a memory space mapping for persistent/disk storages and therefore to the disk I/O requests directed from the Flow Scheduler 72 there is only one address space and hence one logical device for persistent/disk storage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn Gu whose telephone number is (571) 272-0703. The examiner can normally be reached on 9am-5pm, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shawn X Gu
Patent Examiner
Art Unit 2189

Reginald D. Bragdon
REGINALD BRAGDON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

31 May 2007